Antimicrobial-resistant [AMR] Bacteria As A Food-related Threat in Vietnam
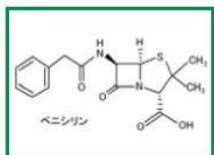
Findings in Vietnam

People
- More than **60%** of people are colonized with AMR-bacteria

Food
- More than **50%** livestock and aquatic food are contaminated with AMR-bacteria

Antibiotics in food
- More than **10%** of food have residual antibiotics

Antibiotics used
- β-lactam and **colistin** are widely used in the community

A HIGH RISK IN EMERGING SUPER-RESISTANT BACTERIA

Supported by **18** manuscripts published by the project in international scientific journals

Probably Due To
- Inappropriate use of antibiotics in agro– and aqua-culture
- Unhygienic handling of food in markets and at homes

Recommendations
- To expand the **monitoring** system in site, target samples, target antibiotics and target bacteria as recommended by WHO
- To expand the **community intervention** through population approach on awareness raising on hygiene and antibiotics use
- To strength the **scientific research** on AMR-bacteria through both domestic and international (research) network

One Health Approach
Urgent initiatives pertaining to the regulation of antibiotics usage in cooperation with ministries concerned

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SATREPS
Science and Technology Research Partnership for Sustainable Development Program

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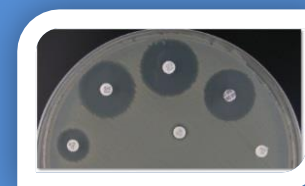
Project for "Determining the Outbreak Mechanisms and Development a Surveillance Model for Multi-Drug Resistant Bacteria"

Terminal Evaluation in Ha Noi

26 August 2016, the 6th Joint Coordinating Committee (JCC) to agree with the results of the project's terminal evaluation was held at NIN in Ha Noi. A terminal evaluat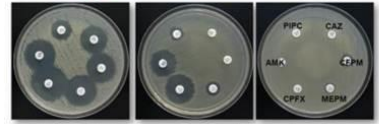ion, which is organized by a joint evaluation team of Viet Nam and Japan, is to review the progress of the project and evaluate the achievements of the project purpose by the five evaluation criteria (Relevance, Effectiveness, Efficiency, Impact and Sustainability). The evaluation team consists of JICA and AMED from Japan, and MOH of Viet Nam. The team has evaluated that the project reaches almost success, since research capacity on AMR in Viet Nam has been considerably strengthened through the project. Moreover, they evaluate the scientific findings of 18 international publications (among 8 are written by Vietnamese first authors) as well as the high relevance of the project coherent with the National Action Plan on AMR in Viet Nam 2013-2020. Recommendations pointed out by the team for better outputs and sustainability, on the other hand, are to accelerate the discussion about the project comprehensive report with related ministries, to have consultation with them about a model of AMR monitoring, to complete a community intervention through population approach, and so on. The project will keep efforts to meet with the recommendations until the end of the project in March 2017.

➤ *Abbreviation: AMR= Antimicrobial Resistance, MOH=the Ministry of Health, AMED=Japan Agency for Medical Research and Development, JICA=Japan International Cooperation Agency, NIN=National Institute of Nutrition.*

Project for Determining the Outbreak Mechanisms and Development of a Surveillance Model for Multi-Drug Resistant Bacteria (3/2012-3/2017)
Science and Research Technology for Sustainable Development (SATREPS)
National Institute of Nutrition and Osaka University

SATREPS Science and Technology Research Partnership for Sustainable Development Program

JICA

Introduction

What is an antimicrobial resistance (AMR) ?
An antimicrobial resistance is a resistance of a microorganism (such as bacteria) to an antimicrobial drug that was originally effective for treatment of infection caused by it. AMR is generally accelerated by the improper use of antibiotics for human and animal. That is, the more antibiotics are abused, the more AMR becomes serious for people and animal health. When bacteria become resistant to many kinds of antibiotic drugs, they are called as **multi-drug resistant bacteria (MDRB).** Thus, MDRB are a serious threat to public health that requires action across all government sectors.

Left: All antibiotics are effective to bacteria.
Middle: Only two antibiotics are effective
Right: All antibiotics are ineffective.

About the Project

Super goal: To prevent the spread of multi-drug resistant bacteria in Viet Nam.

Project purpose: To strengthen research capacity to continuously monitor the multi-drug resistant bacteria in Viet Nam.

❑**Output 1=Research**
The wide spread mechanisms of multi-drug resistant bacteria in Vietnam are clarified microbiologically, pharmacologically and anthropologically.

❑**Output 2=A model of monitoring system**
A comprehensive monitoring system for antibiotics residue and antibiotic-resistant bacteria over the process from food production to intake is developed.

❑**Output 3=Capacity development**
Researchers and technical staff related to food safety monitoring at the targeted research institutes are trained.

Project members in Viet Nam

➤ National Institute of Nutrition

➤ Thai Binh University of Medicine and Pharmacy

➤ Pasteur Institute of Nha Trang

➤ Institute of Public Health HCM

➤ Binh Dien Whole Sale Market Company

➤ Can Tho University

Scientific supports from Japan

Main Activities

Output 1=Research

➤Sampling Activities..
Foods from markets and food production sites, human feces from a community, water from environment.

➤Laboratory analysis
(1) Microbiology
Isolate AMR bacteria (ESBL-producing *E.coli*). Genetic analysis on AMR.
(2) Pharmacology
Test antibiotic residues from foods, protocol development.

➤Field epidemiology/Intervention
(1) Interview with community
Collect information on Knowledge, Attitude and Practice (KAP) on hygiene conditions, etc.

(2) Intervention in a community
Screen risk factors, design intervention activities, using Information, Education and Communication (IEC) materials, before-after evaluation.

Output 2 = A model of monitoring system

Monitoring site	Sampling markets	Food Samples	Target bacteria / antibiotics
Hanoi	Whole Sale Market	Fish	ESBL-producing *E.coli*
Nha Trang	Supermarket	Pork	
HCM	Retail Market	Chicken	Beta lactam antibiotics
		Shrimp	

Output 3 = Capacity development

Achievements

Output 1=Research

➤18 international publications by the project..

Findings include that
➤ More than 60% of residents are colonized with MDRB
➤ More than 50% livestock and aquatic food are contaminated with MDRB.
➤ More than 10% of food have residual antibiotics
➤ β-lactam and colistin antibiotics are widely used in the community.

Such findings suggest that
➤ Using antibiotic inappropriately in community, agro-and aquaculture, as well as unhygienic handling of food in markets and homes could be a main cause leading to the wide dissemination of ESBL-producing bacteria in the society.

Findings from an intervention model (on going as of Jul. 2016)
➤ Intervention activities are targeting to limit the risk factors for spreading antibiotic resistant bacteria in the community. After 7 months implementation, the result of microbiological analysis showed that the prevalence of ESBL-producing bacteria in the community decreased from 59.9% to 35.2%.

Output 2=A model of monitoring system

➤Developed a manual for monitoring .

Pre- printed Version

With a manual, a model of monitoring system of ESBL-producing *E.*coli and residual ampicillin in food has been established in Hanoi, Nha Trang and HCMC, operating by NIN, PINT and IPH. The system has been ready to be implemented on a massive scale towards controlling multi-drug resistant bacteria in food management.

Output 3= Capacity development

➤Strengthen research capacity for food safety and an AMR research network between Viet Nam and Japan..

Organized 25 training courses in Vietnam and in Japan.
One PhD, 4 PhD candidates in Japan as of July 2016.